UNICHECK

2nd ISC (PP-28)
Uploaded: 02/13/2019
Checked: 02/13/2019

Doc vs Internet + Library

97.06% Originality	2.94% Similarity	77 Sources

Web omitted sources: 41 sources found

1. http://repository.unika.ac.id/15915 20.61%
2. https://core.ac.uk/download/pdf/35394735.pdf 7.93%
3. https://docplayer.net/61825650-Apriyantono-a-d-fardiaz-n-l-puspitasari-sedarnawati-and-s-budiyanto. 2.72%
4. http://repository.unika.ac.id/8240/7/07.70.0133%20Amelia%20Sugianto%20DAPUS.pdf 1.91%
5. http://repository.unika.ac.id/view/subjects/G63.html 1.47%
6. https://core.ac.uk/download/pdf/35399880.pdf 1.25%
7. https://core.ac.uk/download/pdf/35394264.pdf 1.25%
8. https://core.ac.uk/download/pdf/35394262.pdf 1.25%
9. https://core.ac.uk/download/pdf/35394738.pdf 1.25%
10. http://repository.unika.ac.id/1447/1/09.70.0041%20Stefan%20Jonathan%20Susanto%20COVER.... 1.25%
11. http://blog.unika.ac.id/publication/laksmi 0.98%
12. http://www.textureanalyser.co.uk/PublishedPapers.htm 0.98%
13. https://www.omicsonline.org/open-access/importance-of-objective-and-subjective-measurement-o... 0.98%
14. https://repository.ipb.ac.id/jspui/bitstream/123456789/57967/9/DAFTAR%20PUSTAKA.pdf 0.98%
15. https://link.springer.com/article/10.1007/s10068-012-0144-8 0.89%
16. http://etds.niu.edu.tw/etdservice/detail?n=17&list=1%E3%80%812%E3%80%813%E3%80%814... 0.85%
17. http://repository.unika.ac.id/2438/7/10.70.0066%20Grace%20Sandy%20Christina%20DAFTAR%... 0.8%
18. http://blog.unika.ac.id/publication/itasulistyawati 0.71%
19. http://repository.unika.ac.id/15913 0.71%
20. http://repository.unika.ac.id/15912 0.71%
21. https://docplayer.net/29805836-The-second-annual-indonesian-scholars-conference-in-taiwan.html 0.71%
22. http://repository.unika.ac.id/15911 0.71%
23. http://repository.unika.ac.id/7060/1/05.70.0044%20Angelina%20Rosita%20Puspaningtyas%20-%... 0.53%
24. https://www.sciencedirect.com/science/article/pii/S0963996906000949 0.53%
25. http://scholar.unand.ac.id/25158/4/Dapus.pdf 0.45%
26. http://www.icef11.org/content/papers/fpe/FPE825.pdf 0.45%
27. http://repository.unika.ac.id/15930 0.4%
28. https://docplayer.info/46346389-Badan-standarisasi-nasional-bsn-2013-sni-2694-2013-tentang-sur.. 0.4%
29. https://docplayer.info/46253539-Pengaruh-lama-penyimpanan-pada-suhu-beku-dan-metode-thawin. 0.4%
30. https://theoldreader.com/profile/lskouras?page=45 0.36%
31. http://jp2hs.org/wp-content/uploads/2018/06/2018-2019-JPII-iPad-Acceptable-Use-Policy.pdf 0.36%
32. https://www.cuckoodesign.com/blog 0.36%
33. http://www.evfinder.com/evfinder_blogarchive_2016.htm 0.36%
34. http://www.open.edu/openlearn/ocw/mod/oucontent/view.php?id=19983&printable=1 0.36%

Similarity
Similarity from a chosen source
abc Possible character replacement
Citation
References

35. https://docplayer.net/64605485-Welcome-to-the-2016-ncda-global-career-development-conference. 0.36%
36. http://docshare.tips/malprixis-of-plastic-surgery_58fcf520ee3435b234991c18.html 0.36%
37. https://wiki.geneseo.edu/display/criticism/Close+Reading 0.36%
38. http://www.mdpi.com/2075-4450/8/2/46/htm 0.36%
39. http://apps.mri.psu.edu/rps16 0.36%
40. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=20007TN9.TXT 0.36%
41. http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs.. 0.36%

Library sources: 26 sources found

Irfan Aditya Setyadji 15.I1.0152.docx 1.25%
Carolina Santoso-8 FEB.doc 1.25%
Soedarini_B14JScFdAg.pdf 1.25%
120355_Paper Cincau Fix (Vio Angela).docx 1.25%
The history of jamu kelompok 26.doc 1.25%
26 Sambung nyawa.docx 1.25%
Green Tea Catechins Reduced the Glycaemic Potential of Bread.pdf 1.02%
Green Tea Catechins Reduced the Glycaemic Potential of Bread (1).pdf 1.02%
SKRIPSI EUNIKE 13.70.0128-6 Nov.docx 0.98%
3. soursop leaves.docx 0.89%
3rd ISC (FNT-01).pdf 0.71%
108134_108106_CLOVE LEAVES HERBAL PAPER (Yosafat).docx 0.71%
19. Kumis kucing - KEL19.docx 0.71%
14.i1.0107_ANASTASIAJEANICE.docx 0.62%
Irene Kumala Dewi 09.70.0094 (1).docx 0.62%
Irene Kumala Dewi 09.70.0094 rev1.docx 0.62%
13th Asean Food Conference.pdf 0.58%
13th Asean Food Conference.pdf 0.58%
12.70.0191-TALENTEA CEZAR JUNIARTI-1.docx 0.53%
MEILIANA WINATA 15.I1.0103.docx 0.53%
Tamara Felicia 15.I.0096.docx 0.53%
Felicia 15.I.0096.docx 0.53%
15.I1.0136 - FRISKA H.D.W.docx 0.36%
Kristalisasi B4 (1).docx 0.36%
14.I1.0089-Monica Rika Ivana.docx 0.36%
14.I1.0089-Monica Rika Ivana (Revisi).docx 0.36%

Library omitted sources: 10 sources found

2nd ISC (PP-28).pdf 100%
2nd ISC (PP-15).pdf 9.97%
2nd ISC (PP-15).pdf 9.97%
2nd ISC (PP-15).pdf 9.97%
2nd ISC (FPE-03).pdf 7.17%
2nd ISC (FPE-03).pdf 7.17%
2nd ISC (FPE-03).pdf 7.17%
3rd ISC (PP-04).pdf 6.99%

2nd ISC (FQS-01).pdf	6.81%
2nd ISC (FQS-01).pdf	6.81%

PP-28

EFFECT OF BREAD IMPROVER ADDITION AND PURPLE SWEET POTATO (*Ipomoea batatas*) FLOUR SUBSTITUTION TO STEAMED BREAD QUALITY

Jessica Andrea[1)], Ivan Widjaja[1)], V. Kristina Ananingsih[2)], Novita Ika Putri[2)]

[1)]Student of department of Food Technology, Faculty of Agricultural Technology, Soegijapranata Catholic University Semarang, Indonesia
[2)]Lecturer of department of Food Technology, Faculty of Agricultural Technology, Soegijapranata Catholic University Semarang, Indonesia

ABSTRACT

Purple sweet potato flour is one of raw material alternatives in making steamed bread to reduce Indonesia's dependence of wheat flour. It also has the potential to be a functional food. Unfortunately, purple sweet potato flour doesn't have gluten as much as wheat flour has. Because of that, to make purple sweet potato bread with quality as good as wheat flour bread, bread improver such as ascorbic acid and guar gum need to be added. The objectives of this research is to determine the best steamed bread fomulation with purple sweet potato flour substitution and bread improver as addition. Purple sweet potato flour substitution for wheat flour wasdone with concentration 0% as control, 10%, 20%, and 30%. Bread improver's concentations used in the main test are 50 ppm of ascorbic acid and 0.5% of guar gum. Steamed bread produced are evaluated in physical, chemical, and sensory properties. The physical evaluation was done by determining the color, texture, and volume of the steamed bread. The chemical evaluation was done by determining the antioxidant activity. The sensory evaluation was done by hedonic ranking to find out the best steamed bread formulation based on consumers liking. The results shows that the more purple sweet potato flour used as the substitution of wheat flour, the bread get harder and the antioxidant activity get higher. Substitution also makes the bread less springy and less in volume. Due to substitution the bread become more reddish and less bright of. The addition of ascorbic acid as much as 50 ppm makes the bread with low hardness and more in volume. Ascorbic acid also makes the antioxidant activity get higher. The addition of guar gum as much as 0.5% will make the bread more elastic. Steamed bread that is most likely desired by the panelists according to overall attribute is the steamed bread with the 10% substitution of purple sweet potato flour with the addition of guar gum.

Keywords: *steamed bread, purple sweet potato flour, ascorbic acid, guar gum*

INTRODUCTION

Steamed breads that are found today generally use wheat flour as the raw material of manufacture. Unfortunately, wheat flour that is widely used in Indonesia are not entirely produced in Indonesia. Therefore, to reduce dependence on wheat flour, flour substitutes need to be found from local materials that can be cultivated into a good food product. Purple sweet potato is one

that is widely available in Indonesia. Purple sweet potatoes containing anthocyanins that have antioxidant activity. The use of purple sweet potato flour in steamed bread will eventually reduce the amount of gluten contained in the dough and it will be less elastic. The addition of ascorbic acid in the form of bread improver and guar gum can be done to improve the characteristics of steamed bread.

MATERIALS AND METHODS

Materials

The materials used in steamed bread making are low protein wheat flour, purple sweet potato flour, yeast, sugar, guar gum, ascorbic acid, water, shortening, and salt.

Steamed bread making

First of all, 1000 g wheat flour was mixed with 12 g yeast, 100 g sugar, and 500 ppm ascorbic acid or 0,5% guar gum. Mixing was done using a low speed (48 rpm) for a minute. Furthermore 520 ml water was added to and mixed at low speed for a minute and medium speed (88 rpm) for a minute. After that, 30 g shortening and 10 g salt was added to the dough and they were mixed using medium speed for 3 minutes. The dough was fermented for 60 minutes at 29,0 ± 0,2^{o}C and relative humidity 73,7 ± 2,5%. The dough was weighed and rounded. Then, the dough was left for 30 minutes at 29,0 ± 0,2^{o}C and relative humidity 73,7 ± 2,5%. The dough was then steamed in a steamer for 15 minutes.

Antioxidant activity determination

Sample was crushed and weighed as much as 0,5 g. Subsequently the samples were extracted with 5 ml of methanol for 2 hours. Then, 0,1 ml of extract was reacted with 3,9 ml DPPH (2,2-diphenyl-1-picrylhydrazyl) for 30 minutes. The absorbance was measured using spectrophotometer at 515 nm. As a blank, 0,1 ml methanol was reacted with 3.9 ml DPPH. Antioxidant activity was measured as %inhibition and calculated using the formula:

$$\% \text{ inhibition} = 1 - \frac{At_{30}}{At_0} \times 100\%$$

At_{30}: sample absorbance at minute 30

At_0 : blank absorbance at minute 0.

Texture Profile Analysis

Texture Profile Analysis (hardness and springiness) was carried out on steamed bread using a Texture Analyzer under the following conditions: probe ball compression, speed compression 5 mm/s, *trigger* 25 N, distance of 50 mm and *sample compression* 50%.

Color Measurements

Color measurements was done using chromameter. First of all, chromameter was calibrated. After that, chromameter can be

used to measure the color of the steamed bread. The color was measured as lightness (L*), reddish-greenish (a*) and yellowish-bluish (b*)

Volume determination

Bread volume was determined using seed displacement method. This method was done by adding millet seeds into a measuring cup up to full. Furthermore, steamed bread was put in measuring cup and the millet seeds was added until full. The rest of millet seeds left (a) behind was measured with a graduated cylinder to determine the volume of steamed bread.

Sensory evaluation

The sensory attributes of steamed bread were evaluated by 50 panelists comprising of untrained student of department of Food Technology, Soegijapranata Catholic University Semarang. Sensory analysis was done for 4 kind of samples, there are steamed bread without substitution, 10% substitution steamed bread without the addition of improver, 10% substitution steamed bread with the addition of ascorbic acid, and 10% substitution steamed bread with the addition of guar gum. All samples were evaluated using 4 point ranking hedonic scale with "4" equaling to most likely desired and "1" equaling to not desirable. The attributes evaluated by the panelists included hardness, springiness, taste, color, dan overall acceptance.

RESULTS AND DISCUSSION

Texture Profile Analysis

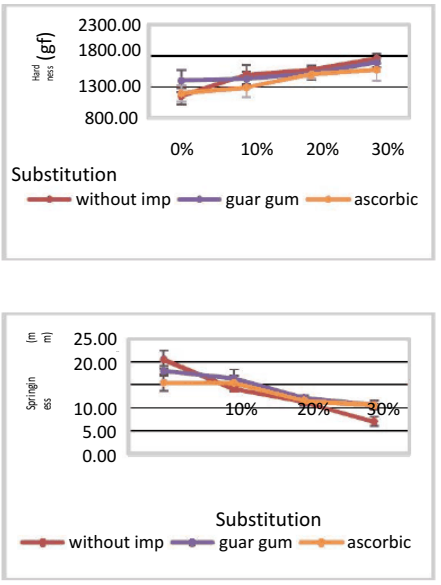


Figure 1. (a) Hardness of Steamed Bread with Various Substitution Treatment and Bread Improver Addition
(b) Springiness of Steamed Bread with Various Substitution Treatment and Bread Improver Addition

Increased concentrations of purple sweet potato flour substitution will increase the hardness and reduce the springiness of steamed bread. Purple sweet potato flour substitution will lower the gluten content of the dough. Gluten is a component that has viscoelastic properties when mixed with water and make the product texture becomes not hard (Wang et al., 2007).

Steamed bread substituted with a purple sweet potato flour and given the addition of ascorbic acid has a lower hardness value. According to Maleki et al. (1980), the hardness of bread associated with the volume of bread. The greater volume of steamed bread caused the rate hardening of bread will be declined. The addition of guar gum on steamed bread with purple sweet potato flour substitution will increase the value of springiness. Guar gum is one of the hydrocolloid which is capable of producing viscoelastic properties and improve the water binding ability of the dough (Matz, 1992).

Volume

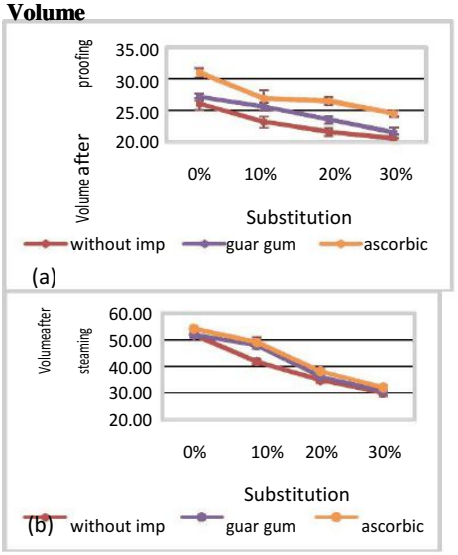
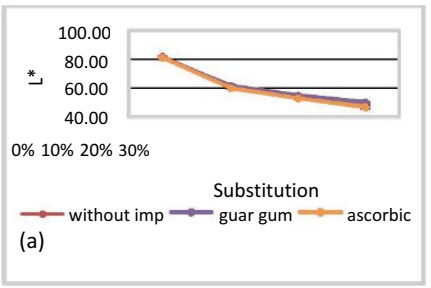


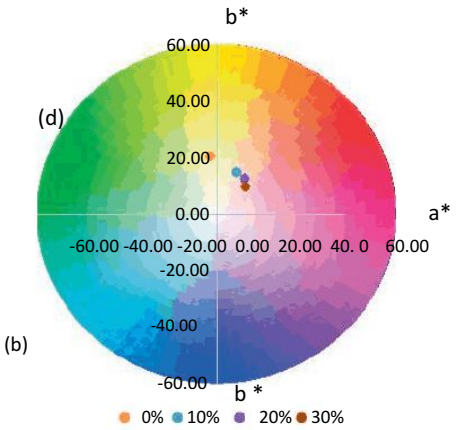
Figure 2. (a) Volume of Dough after Proofing with Various Substitution Treatment and Bread Improver Addition

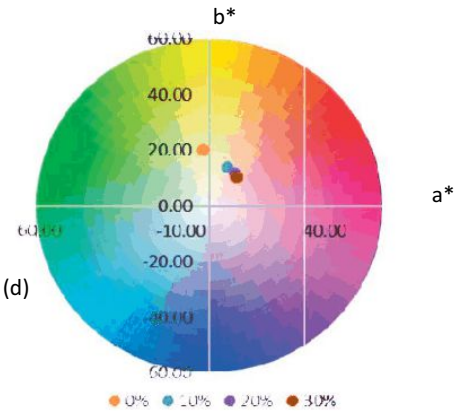
(b) Volume of Steamed Bread with Various Substitution Treatment and Bread Improver Addition

The higher substitution on the purple sweet potato flour steamed bread will cause either a decrease in bread volume after proofing and after steaming. The less gluten in dough will produce a dough with less elasticity, so the ability of gas retention becomes smaller (Bennion & Hughes, 1975; Matz, 1992). Steamed breads were given the addition of ascorbic acid have a greater volume than the steamed breads were given the addition of guar gum or without the addition of bread improver. Ascorbic acid acts as oxidizing agent that will strengthen the gluten network in dough so the gas retention becomes more maximum (Matz, 1992).

Color







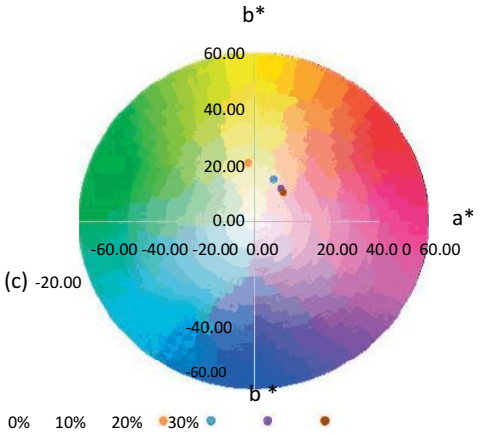


Figure 3. (a) Lightness of Steamed Bread with Various Substitution Treatment and Bread Improver Addition
(b) Color of Steamed Bread with Various Substitution Treatment Without Bread Improver Addition
(c) Color of Steamed Bread with Various Substitution Treatment and Ascorbic Acid Addition
(d) Color of Steamed Bread with Various Substitution Treatment and Guar Gum Addition

Increased concentrations of purple sweet potato flour substitution will red uce the value of L* and b*, but will increase the value of a*. Decline in the value of L* (brightness) due to the decrease in whiteness purple sweet potato flour due to enzymatic reactions (enzymatic browning) (Ambarsari, 2009). Increase of value a* and decrease of value b* indicate that the purple sweet potato flour substitution will increase the intensity of the red color and lower the inte nsity of the yellow color in steamed breads.

Antioxidant Activity

Increased concentrations of purple sweet potato flour substitution will increase the antioxidant activity of the steamed bread. The increase is due to the purple sweet potato flour are added have antioxidant activity of 65.69 ± 0.25%. Purple sweet potato anthocyanin pigments which have to function as an antioxidant.

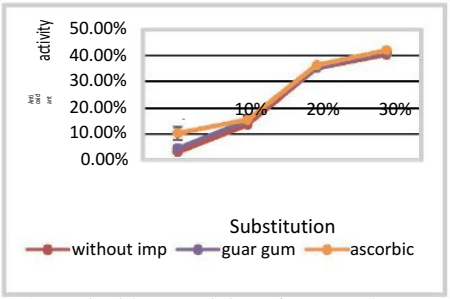


Figure 4. Antioxidant Activity of Steamed Bread with Various Substitution Treatment and Bread Improver Addition

Sensory

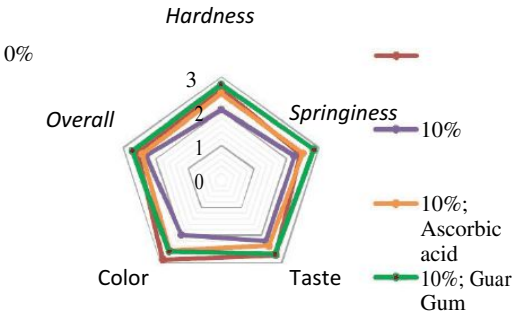


Figure 5. Ranking Hedonic Test of Steamed Bread with Various Treatment from Hardness, Springiness, Taste, Color, and Overall Parameters.

Steamed bread with the 10% substitution purple sweet potato without the addition of bread improver is the least preferred treatment compared to other treatments. On the attributes of hardness, springiness, and overall, the most preferred treatment is 10% substitution treatment with the addition of guar gum. On the attributes of color and taste, the most preferred treatment is a steamed bread controls (0% substitution, without bread improver).

CONCLUSIONS

The more purple sweet potato flour used as the substitution of wheat flour, the bread get harder and less springy. Substitution also makes the bread less in volume and the antioxidant activity get higher. Due to substitution, the bread become more reddish and bluish, also less bright of.

The addition of ascorbic acid as much as 50 ppm makes the bread with low hardness and more in volume. Ascorbic acid also makes the antioxidant activity get higher.

The addition of guar gum as much as 0.5% will make the bread more elastic.

Steamed bread that is most likely desired by the panelists according to overall attribute is the steamed bread with the 10%

substitution of purple sweet potato flour with the addition of guar gum.

REFERENCES

Ambarsari, Indrie; Sarjana; and Abdul Choliq. (2009). Rekomendasi dalam Penetapan Standar Mutu Tepung Ubi Jalar. Jurnal Standarisasi Vol. 11, No.3, 212-219.

Bennion, M & O, Hughes. (1970). Introductory Foods, 6th edition. Collier Macmillan Publisher. London.

Maleki, M.; R. C. Hoseney; and P. J. Mattern. (1980). Effect of Loaf Volume, Moisture Content, and Protein Quality on the Softness and Staling Rate of Bread. Cereal Chem. 57(2):138-140.

Matz, S. A. (1992). Bakery Technology and Enginering, 3th Edition. Van Nostrand Reinhold. New York.

Wang, R.; W. Zhou; and M. Isabelle. (2006). Comparison Study of the Effect of Green Tea Extract (GTE) on the Quality by Instrumental Analysis and Sensory Evaluation. Food Research International 40:470-479.